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it may be that the *Littorina*, the animal unlike that of the *Trivia* being a vegetarian, finds its favorite food in some marine vegetable form peculiar to the granite, or that some form of vegetation, which grows upon the shales as well as the harder rock, has some quality imparted to it by the granite which renders it more palatable to the *Littorina*, and hence its apparent preference for a granitic habitat or station.

THE ALPINE FLORA OF COLORADO.

BY REV. E. L. GREENE.

By means of the collections made and distributed a few years since by Dr. C. C. Parry and Messrs. Hall and Harbour, the botany of the Alpine region of the Rocky Mountains is very well represented to the few who have been able to avail themselves of sets of specimens made by these collectors. Dr. Parry has been collecting in this region again during the past season, and will probably soon be ready to distribute sets that will very beautifully represent this Alpine flora of our West. For the pleasure of many interested parties, who may fail to procure these rare and valuable collections, we purpose giving, through our common friend the *NATURALIST*, a brief sketch of some of these beauties of the higher mountains, as they appear to one who has more than once visited them in their Alpine homes.

At the altitude of nearly eleven thousand feet, as one passes upward among the pines and spruces which become more scattering in numbers, and more and more dwarfed in stature, because we are rapidly approaching the limit of trees, no one who notices flowers will fail to observe first of all, the brilliant painted cup (*Castilleia*), the scarlet flowered varieties of which might at first be mistaken for the common *Castilleia coccinea*. But this plant is of a quite distinct species; and notwithstanding the exceeding brightness of its flowers, at this particular altitude, passing as they do into almost every possible shade of red, and sometimes to a beautiful mauve or purple (so that it is difficult to find two different roots producing the same color of flower), its true name is

Castilleja pallida, or pale painted cup; for in the marshes below, say at an altitude of seven thousand feet, and from that point upwards to near the timber line, wherever the plant grows, it bears handsome pale cream-colored flowers. Also above the timber line where it again appears and continues in a very reduced form to flourish at twelve thousand feet, the flowers are pallid again, though with a more decidedly yellowish cast, in the very dwarf and high-alpine variety.

One seldom meets with such exceedingly beautiful wild flowers as are found in just this region of the last of the trees. From their sources on the borders of snow fields just above, noisy streamlets come dancing down, their banks often fairly crowded, and their foaming waters hidden by the luxuriant foliage, and pendent blue flower-clusters of *Mertensia Sibirica*. Where the stream is broader and the water shallow, the splendid *Primula Parryi* almost startles you as you come suddenly upon it, so tropically rich are its light green, showy leaves, and its heavy umbels of large, magenta-purple flowers. Altogether the finest plant of the Rocky Mountains, it seems almost strange that it should have selected its home so near the everlasting snows, and in a region so remote from the haunts of men. It grows usually in thick clumps, in the midst of shallow parts of the streams, its roots running down among the rocks; though sometimes we have found it in very wet, shady ground away from the running waters.

Saxifraga punctata, with very fine roundish leaves, and elegant panicles of pinkish flowers, usually grows in the shallow streamlets with this beautiful *Primula*, and also *Mimulus luteus*, well enough known in some fine cultivated varieties. In wet shade at about this altitude we find plenty of *Caltha leptosepala*, calling to mind the marsh marigold so abundant in wet meadows on the other side of the Mississippi; but this Alpine species bears only one flower to a stem, the color of which is bluish outside and white within. Nor must we omit to mention the beautiful perennial larkspur (*Delphinium elatum*), whose deep blue spikes are another decided ornament to this region; nor the two very pretty purple-flowered species of *Pedicularis* (*P. Grœnlandica* and *P. Sudetica*); nor *Parnassia fimbriata* with its beautifully fringed white petals.

In drier soils, among the now dwarfed and scattering pines (*Pinus contorta* and *P. aristata*), we find plenty of a very pretty small, blue-flowered *Polemonium* (*P. pulchellum*), and likewise

variety of *Eriogonum umbellatum*, with cream-colored umbels. And here we must leave unmentioned almost countless species and varieties of *Senecio*, several interesting saxifrages and crowfoots, and daisy-like *Erigerons*, and pass upward toward the snows. Leaving below the last of the stunted specimens of spruce and pine and rising to those vast, treeless, grassy slopes that lie just above the limit of trees, we enter upon a new field. Woody plants are yet represented by straggling willows of several species, growing possibly to the height of one or two feet, and often monopolizing considerable tracts of land. One may chance also to find a patch of the rare, high-alpine laurel, attaining a height of perhaps one inch, but bearing beautiful large red flowers. This is supposed to be a form of *Kalmia glauca*. It is however seldom met with. Of herbaceous flowering plants, here at an altitude of twelve thousand feet, there yet remain some splendid examples. *Polemonium confertum*, in its typical form, is one of the finest of this handsome genus; yet this is surpassed by a variety (*P. confertum*, var. *mellitum*) of the same species. The first mentioned form, growing on bleak, open ground, either level or sloping northward or westward, is smaller every way, except in the dark-blue corolla. The variety grows taller, has a luxuriant foliage, and usually pale or almost white flowers. It has gained some excellent points of character by selecting for its abiding places the shelter of high rocks, on the south sides where it is well protected from cold winds and driving storms of snow, which not unfrequently visit these sublime heights, even in August, the flower month; and that, to the greater inconvenience of flower gatherers, than of the flowers themselves. The largest plant of these altitudes is a coarse, hoary composite (*Actinella grandiflora*), growing some eight or ten inches high, and producing heads of yellow flowers as large as those of the wild sunflower of the plains. Here, where so few things rise to the height of more than two or three inches, this species becomes very conspicuous. It usually grows on very exposed situations, and the large heads of flowers, borne upon stout and well clothed stems, turn their backs to the storms, and remain stoically indifferent to the peltings of every sleeting blast that sweeps over their dreary abode. *Mertensia alpina* is one of the most elegant of these tenants of the heights. With its stems, three or four inches high, bearing bunches of deep blue, nodding flowers, it looks remarkably pretty,

and is withal quite showy among so many plants of smaller growth. Here we find two very interesting Alpine clovers, *Trifolium dasyphyllum* and *T. nanum*. The former is much reduced in size, the stems, two or three inches high, supporting the large heads of pink and purple flowers, are conspicuously longer than the leaves. *T. nanum* grows chiefly on very bleak and barren summits, and is yet far smaller. It can scarcely be said to have even a flower-stalk. The flowers, too, are not produced in heads as in other species, but grow either singly, or two together; they are very large, of a pink color, and lie as closely as they can to the matted leaves. The pale green spreading masses of the minute *Phlox Hoodii*, when out of bloom, would very likely be passed by for patches of moss; but now they are dotted all over or fairly whitened with pink-eyed flowers, and are perfectly charming. *Silene acaulis* is another of these matted, mossy, Alpine beauties, with almost stemless, purple flowers. *Saxifraga serpyllifolia*, almost the smallest saxifrage one meets with here, has remarkably large, golden-yellow petals. And now, just a little above us, begin the long, white lines or extended fields of never-melting snows. We hasten to their borders, curious to see what floral beauties have chosen to bloom there; and we find not a few very notable ones.

Within six feet of the snow grows the small but bright-eyed and pretty *Primula angustifolia*; *Lloydia serotina*, a rather small liliaceous plant, with solitary white flowers; *Gentiana frigida*, a handsome gentian with large corollas, white, marked and speckled with blue, and which are not afraid to expand. *Eritrichium arcticoides* is a most elegant, forget-me-not-like plant of about this altitude, growing in very small, silvery masses and sending out very short stems with the very prettiest bright blue flowers. The showiest of all is *Ranunculus adoneus*, a crowfoot with rather stout stems, small and finely divided leaves, and remarkably large and well-formed golden petals. It is certainly one of the very finest species of its genus, and even shows some inclination to produce double flowers. Snow banks that are shut in closely by high surrounding mountains seem as if bordered with gold by the abundance of this plant.

On yet higher and drier points are many more very interesting species, of which we will speak of one here and there. Among some of the highest cliffs one finds in the crevices of the rocks a beautiful small-flowered columbine, a variety of *Aquilegia*

vulgaris. *Claytonia Arctica*, var. *megarrhiza*, with large tufts of broad, fleshy leaves, grows on some very barren summits among the rocks, and by the freshness of its appearance in such a place, away above the range of the most dwarfed of high-alpine plants, almost astonishes you. The flowers are quite similar to those of *Claytonia Virginica*, and the whole plant is rather fine looking. It has a marvellously large fleshy root, from which it was named by Dr. Parry, *C. megarrhiza*. A little, yellow-rayed composite, with heads of flowers scarcely raised above the surface of the rocky ground, is *Aplopappus pygmæus*; a pygmy indeed in contrast with some of its kindred species of the lower mountains and of the plains. *A. Lyallii* is another very dwarf, high-alpine species less frequently met with.

Talinum pygmæum is a fine little dwarf, looking very like a *Claytonia*, but producing among its tufts of narrow fleshy leaves numerous very bright purple flowers.

There remain yet many of these Alpine flowers well worth notice; but we are now far above the "music of the pines," looking downward over many a silvery lake, and over many a wide-extended field of dazzling snow. Eastward lies the blue line of distant plains, and near us in the west are piled range on range of snow-streaked, rocky Mountains. The flowers that bloom at our feet we shall forget a moment, and enjoy the wondrous grandeur of this sublime landscape into which our botanizing has so delightfully led us.

CERTAIN PECULIARITIES IN THE CRANIA OF THE MOUND-BUILDERS.

BY J. W. FOSTER, LL. D.*

THE "Kennicott Mound," near Chicago, yielded three frontal bones—the only parts of the skeletons capable of preservation—

* An abstract of a paper read before the Dubuque Meeting of the American Association for the Advancement of Science, Aug., 1872.

After giving an account of the several skulls that he had examined from mounds in Indiana, Illinois and Iowa, with a comparison of them with various other skulls, illustrated by a number of drawings, Dr. Foster gives his conclusions regarding the distinctive characters of the crania of the mound-building race, which we quote entire, preceded by a copy of a drawing of the singular skull from the "Kennicott Mound," and his remarks upon it. We regret that we are unable to print the paper in full, but we trust that it will soon appear in the volume of the Proceedings of the meeting.—EDS.